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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* LARS SEVERINSSON

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Appeal 2007-2898  
Application 10/722,938  
Technology Center 3600

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Decided: April 28, 2008

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Before TERRY J. OWENS, HUBERT C. LORIN, and JOHN C. KERINS,  
*Administrative Patent Judges.*

KERINS, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

Lars Severinsson (Appellant) seeks our review under 35 U.S.C. § 134 of the final rejection of claims 1-3. We have jurisdiction under 35 U.S.C. § 6(b) (2002). An oral hearing in this appeal was held on April 10, 2008, with Benjamin J. Lehberger, Esq., appearing on behalf of Appellant.

## SUMMARY OF DECISION

We REVERSE.

### THE INVENTION

Appellant's invention is an applied brake force sensor in a vehicle brake arrangement, in which an enclosed, elastically deformable medium is provided to receive the reaction force from a thrust rod applying a braking force. A force sensor is remotely located from the elastically deformable medium in order to protect the sensor from exposure to extreme heat, and the reaction force acting upon the elastically deformable medium is transmitted to the force sensor by an axially movable push rod that is in contact with the elastically deformable medium. The application of braking force is stopped when the sensed force achieves a predetermined desired level.

Claim 1, reproduced below, is representative of the subject matter on appeal:

1. A device in a vehicle brake arrangement for determining an applied brake force, comprising an electric motor, a thrust rod gear driven by the motor, a thrust rod that applies a brake force when the gear is driven, an enclosed elastically deformable medium, on which a reaction force from the brake force is to act, and a force sensor located remotely from the elastically deformable medium, characterized in that an axially movable push rod is in contact with the medium, which axially moveable push rod transmits a force from

the elastically deformable medium to the remotely located force sensor, which sensor transmits a signal to the electric motor that causes the motor to stop the application of brake force when a desired amount of force has been attained.

### THE REJECTION

The Examiner relies upon the following as evidence of unpatentability:

Kojima	US 5,739,626	April 14, 1998
Rinsma	WO 99/37939	July 29, 1999

The following rejection is before us for review:

1. Claims 1-3 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Published PCT Application WO 99/37939 (“Rinsma”), in view of the Kojima patent (“Kojima”).

### ISSUE

The issue before us is whether Appellant has shown that the Examiner erred in concluding that the subject matter of Claims 1-3 is obvious, and therefore unpatentable, over the Rinsma and Kojima references.

### FINDINGS OF FACT

The following enumerated findings of fact (FF) are supported by at least a preponderance of the evidence. *Ethicon, Inc. v. Quigg*, 849 F.2d

1422, 1427 (Fed. Cir. 1988) (explaining the general evidentiary standard for proceedings before the Office).

FF 1. The Rinsma reference discloses a vehicle brake arrangement having an elastically deformable medium (fluid) 52 in contact with a sensor element 50 that senses a braking reaction force. (Rinsma, Fig. 3, p. 6, ll. 3-15).

FF 2. The Kojima patent discloses a piezoelectric sensor assembly that employs a diaphragm 11 exposed to a compressible fluid (gas), the diaphragm 11 being coupled to a sensor element 7 via an axially movable push rod 10. The diaphragm separates the compressible fluid from the push rod and sensor element. (Kojima, Fig. 1; Col. 1, l. 64-Col. 2, l. 7; Col 4, ll. 10-17).

FF 3. Taking into account the disclosures and drawings of the two cited references, the Examiner's proposed substitution of the Kojima sensor assembly in the Rinsma brake arrangement, in place of the sensor disclosed in Rinsma, would yield a brake arrangement in which the sensor element would not be directly in contact with the compressible fluid. (Rinsma, Fig. 3; Kojima, Fig. 1). The push rod in the proposed construction would also be separated from contact with the compressible fluid by diaphragm 11. (Kojima, Fig. 1; Col. 2, ll. 3-4).

FF 4. In the Examiner's proposed modification of Rinsma to substitute the Kojima sensor assembly for the Rinsma sensor, the diaphragm would be required to be removed or otherwise physically altered in order for

the device to have the axially movable push rod (Kojima, Fig. 1, element 10) in contact with the elastically deformable medium (Rinsma, Fig. 3, element 52). (Rinsma, Fig. 3; Kojima, Fig. 1)

## PRINCIPLES OF LAW

Section 103 precludes issuance of a patent when, “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1734 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). See also *KSR*, 127 S.Ct. at 1734 (*Graham* factors continue to define the inquiry that controls).

In *KSR*, the Supreme Court emphasized “the need for caution in granting a patent based on the combination of elements found in the prior art,” *id.* at 1739, and discussed circumstances in which a patent might be determined to be obvious. In particular, the Supreme Court emphasized that “the principles laid down in *Graham* reaffirmed the ‘functional approach’ of *Hotchkiss*, 11 How. 248.” *KSR*, 127 S.Ct. at 1739 (*citing Graham*, 383 U.S.

at 12), and reaffirmed principles based on its precedent that, “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *Id.*

### ANALYSIS

The ensuing discussion is limited to claim 1, in that it is the only independent claim on appeal.

The Examiner rejects claim 1 under 35 U.S.C. § 103, asserting that the Rinsma reference discloses each element of the claims, with the exception of employing a push rod disposed between a sensor element and an elastically deformable medium which transmits a reaction force from the brake to the sensor element. (Answer 3)(FF 1). The Kojima patent is cited as teaching a piezoelectric sensor assembly designed for use in high temperature applications, the assembly having a push rod which transmits a force imposed on a diaphragm to a piezoelectric sensor element. (Answer 3-4)(FF 2).The Examiner concludes that it would have been obvious to have provided the Rinsma brake apparatus with the sensor disclosed in Kojima, such that an off-the-shelf sensor designed for high temperature use could be used to reduce manufacturing costs. (Answer 4). The Examiner further opines that this modification to Rinsma to incorporate the Kojima sensor assembly would not be a substantial one, the Kojima sensor would simply be inserted into the brake apparatus in the place of the sensor 50 employed in Rinsma. (*Id.*).

Appellant counters that the primary objective of Rinsma is to alleviate problems in sensing braking forces arising from transverse or radial loadings, and that this objective is met, at least in part, by having a load sensor that directly engages a compressible fluid to measure the pressure of the fluid. (Appeal Br. 7). Were the Rinsma brake assembly modified to employ the Kojima sensor assembly, the sensor element would no longer directly engage the compressible fluid. (FF 3).

In the Examiner's proposed modification, not only would the sensor element not directly engage the compressible fluid, but the push rod also would not directly engage the compressible fluid. (FF 3). The Kojima sensor assembly includes a diaphragm 11 that separates a fluid (gas under compression), whose pressure is being sensed, from the push rod and the sensor element. (FF 2). Notably, the allegedly obvious and insubstantial (according to the Examiner) modification of replacing the sensor in Rinsma with the sensor assembly disclosed by Kojima results in a device that does not include the element or limitation in claim 1 requiring the axially movable push rod to be "in contact with the [elastically deformable] medium". (Appeal Br., Claims Appendix).

Removal of the diaphragm would place the pushrod in contact with the elastically deformable medium (the fluid whose pressure is being measured)(FF 4), and would result in a device that reads on claim 1. However, there is no persuasive evidence or logical reasoning presented in



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the record that such further modification would have been obvious to a person of ordinary skill in the art.

We therefore conclude that the Examiner has failed to establish a prima facie case of obviousness as to claim 1. The rejection of claims 1-3 will accordingly be reversed.

#### CONCLUSION OF LAW

We conclude that reversible error exists in the rejection of claims 1-3 under 35 U.S.C. §103(a).

#### DECISION

The decision of the Examiner to reject claims 1-3 is reversed.

#### REVERSED

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